

3P

GHRs - Space Telescope Final Report
Contract Number NAS5-30511
PI: John C. Brandt

Activities involving the Goddard High Resolution Spectrograph (GHRs) are continuing and have years to go. This contract was terminated for the purpose of converting the support of Guaranteed Time Observers (GTOs) to grants.

The GHRs is an ultraviolet spectrograph (wavelength range 1150-3200Å) with spectral resolutions ($\lambda/\Delta\lambda$) of 2×10^3 , 2×10^4 , and 1×10^5 . Despite the problem of spherical aberration, the GHRs operated with full spectral resolution on both sides until ~ August 1992. The story is complex, but, in essence, operations on side 2 are routinely carried out. [After the servicing mission in late 1993, we expect routine operation of both sides.]

The contract with the University of Colorado supports the activities of Dr. John C. Brandt, who has been the Principal Investigator since the inception of the GHRs. The activities fall into two general areas.

(1) Team Activities.

The PI is responsible for the overall GHRs Science Program including final submission to the Space Telescope Science Institute and accounting for the team's observing time. He is also responsible for Team Projects including preparation of the results for publication. The PI represents the GHRs Science Team to the HST project, NASA Headquarters, the Space Telescope Science Institute, and the public. Specific meetings attended throughout this contract are of the Space Telescope Science Working Group, the Guaranteed Time Observers Coordinating Group, and the COSTAR Science Council. Carrying out the responsibilities of PI also requires frequent liaison with GHRs team members at the Goddard Space Flight Center.

(2) Research Activities

The PI has guaranteed HST observing time to obtain an ultraviolet atlas of a bright comet. A major goal is to determine the D/H ratio in a bright comet.

The original intent was to carry out these observations on Halley's comet in 1986. The launch delay to April 1990 meant that a different comet would have to be used. Unfortunately, we are still waiting for a comet of suitable brightness.

The staff consists of the PI; Research Associate, Dr. Cora E. Randall; Graduate Research Assistant, Martin Snow; and Undergraduate Research Assistant Carolyn Collins Petersen. Our major equipment purchase is the computer LYRAE which we use extensively in all phases of our work.

Status of the GHRs GTO Observational program at the end of the contract was that fairly extensive observations were obtained as part of the Science Assessment Observations (SAO), Early Release Observations (ERO), Cycle O, and a very small part of Cycle 1. The data obtained enabled the GHRs Team to publish 11 papers in the 10 August 1991 issue of The Astrophysical Journal. The list follows:

(1) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: THE GALACTIC HALO AND THE Lya FOREST AT LOW REDSHIFT IN 3C 273, Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland, L 21

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(2) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: ULTRAVIOLET SPECTRA OF A STARBURST KNOT IN NGC 1068, J.B. Hutchings, F. Bruhweiler, A. Boggess, S.R. Heap, D. Ebbets, E. Beaver, E. Rosenblatt, K.Q. Truong, M. Perez, R. Westmacott, L25

(3) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: SPECTROSCOPIC DETERMINATION OF STELLAR PARAMETERS OF MELNICK 42, AN O3f STAR IN THE LARGE MAGELLANIC CLOUD, S.R. Heap, B. Altner, D. Ebbets, I. Hubeny, J.B. Hutchings, R.P. Kudritzki, S.A. Voels, S. Haser, A. Pauldrach, J. Puls, & K. Butler, L29

(4) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: EVIDENCE FOR PHOTOSPHERIC MICROTURBULENCE IN EARLY O STARS: ARE SURFACE GRAVITIES SYSTEMATICALLY UNDERESTIMATED ?, I Hubeny, S.R. Heap, & B. Altner, L33

(5) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: HIGH-RESOLUTION OBSERVATIONS OF THE 1942 Å RESONANCE LINE OF HG II IN THE CHEMICALLY PECULIAR B STAR, κ LUPI, David S. Lecrone, Glenn M. Wahlgren, & Sveneric G. Johansson, L37

(6) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: A DEMONSTRATION OF SPECTRAL RESOLUTION AND EXPERIMENTS WITH DECONVOLUTION, Glenn M. Wahlgren, David S. Lecrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets, L41

(7) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: THE CHROMOSPHERE OF α TAURI, Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter, L45

(8) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: RESOLVED VELOCITY AND DENSITY STRUCTURE IN THE β PICTORIS CIRCUMSTELLAR GAS, A. Boggess, Frederick C. Bruhweiler, C.A. Grady, Dennis C. Ebbets, Yoji Kondo, L.M. Trafton, John C. Brandt, & S.R. Heap, L49

(9) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: ELEMENT ABUNDANCES AS A FUNCTION OF VELOCITY IN THE NEUTRAL GAS TOWARD ξ PERSEI, Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach, L53

(10) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: ELEMENTAL ABUNDANCES IN THE DIFFUSE CLOUDS

TOWARD ξ PERSEI, Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis c. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia, L57

(11) FIRST RESULTS FROM THE GODDARD HIGH-RESOLUTION SPECTROGRAPH: C I, S I, AND CO TOWARD ξ PERSEI AND THE PHYSICAL CONDITION IN DIFFUSE CLOUDS, Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer, L61

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